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Prime Minister Addresses CSIR Directors' Conference

Smt. Indira Gandhi, Prime Minister, and the Council of Directors of CSIR, inaugurated the 31st Conference of directors of the national laboratories of CSIR, held in New Delhi on 26 April 1981.

In her brief address Smt. Gandhi exhorted the scientists to look beyond their immediate problems and help create an atmosphere in which the country would take the country ahead. "How much had been said about the lack of scientific temper in the country, it will remain very far from it", she concluded.

In a note of the difficult situation in India and in fact the whole world was passing through, the Prime Minister said "India has always geared itself to meet challenges, and it has on most occasions been able to come out stronger rather than weaker". The present situation in the country demanded the mobilization of all

resources, not only the financial ones but also the human as well as natural resources. She emphasized that the challenges were to be faced unitedly and in a constructive manner.

Agreeing that some useful suggestions which had been made could not be implemented for want of resources, the Prime Minister said "it was exasperating to see that though we had the capability but for lack of resources or adequate equipment we were not able to follow on all these things". "As far as we possibly can, we are trying to help our scientists", Smt. Gandhi added.

Earlier, the CSIR's Vice President Prof. S. Nurul Hasan, in his welcome address mentioned the initiatives that had been taken up to further strengthen CSIR. He said that the four laboratories had come back to CSIR from the ministries to which they were transferred

in April 1978. Also, the question of transferring back the three museums and ten industrial research associations was being reviewed. An autonomous Centre for Cellular and Molecular Biology had been set up at Hyderabad; a Regional Research Laboratory was being established at Bhopal; the Structural Engineering Research Centre had been bifurcated into two independent laboratories, one each at Roorkee and Madras; the Centre for the Study of Science, Technology and Development had been given the status of an independent centre; and there was a proposal to set up a CSIR Complex at Palampur, Himachal Pradesh. The CSIR Vice President further said that the Council was building closer linkages with some of the economic ministries and major industries, especially in the public sector.

Referring to the report of the working group on Science and Technology, Prof. Hasan said that CSIR had been given a major responsibility in many areas of national economic endeavour. In order that the CSIR laboratories make the desired contribution a review of all existing projects will have to be carried out. He hoped that with greater cooperation between CSIR, DGTD and NRDC, the country's import bill on technology could be reduced. He also stressed the need for devoting greater



Indira Gandhi releasing the first volume of the NML monograph. Seated with the Prime Minister are (from left) the CSIR's Vice President Prof. S. Nurul Hasan, and the then DGSIR Prof. M.G.K. Menon

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attention to basic research, especially in frontier and interdisciplinary areas, and for this the CSIR's linkages with academic institutions were to be strengthened.

Prof. Hasan assured the scientists that the Government was deeply conscious of the need to improve the working and living conditions as well as the career prospects of the scientists.

The Chairmen of the Coordination Councils of CSIR presented the major achievements in their respective groups.

Among the items discussed at the two-day conference were: Functioning of Executive Committees, Research Advisory Councils, and Coordination Councils; Reviewing of performance of laboratories; Induction of new talent; Revision of procedures for creation of posts, and completion of probationary period; Simplification of recruitment procedures and merit promotion scheme; Distribution of royalty/premia; Housing and medical facilities; and Setting up of Arbitration Tribunals and Joint Consultative Machinery.

Before inaugurating the conference Prime Minister declared open the CSIR Science Centre which in fact was the venue for the conference. She also released the first volume of a monograph 'Ores & Minerals of India—Beneficiation and Agglomeration Techniques for Industrial and Economic Exploitation' brought out by the National Metallurgical Laboratory (NML), Jamshedpur.

Ores & Minerals of India—Beneficiation and Agglomeration Techniques for Industrial and Economic Exploitation

NML is compiling the above monograph on the basis of the monumental R&D work that the laboratory has carried out during the last three decades on beneficiation and agglomeration of nearly 500 samples of different types of low grade ores and minerals from various parts of the country. The monograph contains exhaustive data and flowsheets for recovery and utilization of the low grade ores and

minerals. Many commercial plants for beneficiation, sintering and pelletization have either been established or being planned, both in public and private sector, based on the data and flowsheets furnished by NML.

The first volume that has been released deals with statistical data of Indian ores and minerals relating to reserves, production, import, export,

etc. and the data and flow-sheets for beneficiation and agglomeration of ores from various deposits of including many recently explored deposits. The second volume contains studies on manganese, chromite, ferrous and titaniferous ores, ferrous metallic ores, strategic minerals, fertilizer minerals, etc. is printed.

International Symposium on Malaria, Filariasis and Leishmaniasis: CDRI

An international symposium on Chemotherapy and Immunology in the Control of Malaria, Filariasis and Leishmaniasis was held at the Central Drug Research Institute (CDRI), Lucknow, from 18 to 21 February 1981 to discuss the present status of and problems and prospects in the control of these diseases. Sponsored by the Council of Scientific & Industrial Research (CSIR) and the Indian Council of Medical Research (ICMR), the symposium had as its chairman Lord Alexander Todd, Nobel Laureate and former President of the Royal Society of London; thirty-five experts from abroad and about 100 Indian scientists attended.

In the inaugural session, Prof. V. Ramalingaswami, ICMR's Director General, said that the objective of the symposium was to highlight the need for integrated multidisciplinary research to control these diseases.

Dr A.O. Lucas, Director, Special Programme on Research and Training in Tropical Diseases, described the newer tools available as a result of recent developments for the control of tropical diseases and stressed the necessity of developing 'effective, simple and cheaper tools' for eradicating these diseases in developing countries. He called for rough intensive research and international collaboration between biomedical and social scientists.



Seen at the symposium (from right) are: Dr Nitya Nand, Director, Central Drug Research Institute; Lord Alexander Todd, Nobel Laureate; Prof. M.G.K. Menon, the then Director General, Scientific and Industrial Research; and Prof. V. Ramalingaswami, Director General, Indian Council of Medical Research

the malaria, filaria and leishmania situation in India was reviewed and the steps being taken by the government under the modified malaria eradication programme started in 1976 were outlined.

Seven scientific sessions were devoted to malaria, two to chemotherapy and immunology of filaria, and one each to leishmaniasis and immunoregulators. The structure-activity relationship of the antimalarial primaquine and its analogues and modifications were discussed. Investigations made on the biochemistry of *Plasmodium*, throwing light on the differences between the metabolism of the parasite and that of the human host, were presented. The need to study the surface antigens of sporozoite and erythrocytic stages of the human malaria parasite was stressed. Irradiated sporozoites were reported to be useful in inducing immunity in animals and humans for causal prophylaxis of malaria; the immunity, lasting for five months, was found to be species- and stage-specific. The preparation of parasite antigens by hybridoma technique was discussed. It was suggested that the study of the phenomenon of asexual erythrocytic schizogony should be undertaken in primate malaria. Also reported was the work on development of newer and safer adjuvants for malaria vaccine.

The challenges faced in the design of new antifilarial drugs, namely inadequate knowledge of the biochemistry of the parasite and immune response of the host, non-availability of suitable laboratory models for screening and inability to culture the parasite *in vitro*, were discussed in the sessions on filariasis. A new candidate drug for filariasis developed by CDRI, 35 years after the introduction of diethylcarbamazine, was reported. A few known anti-parasitic drugs, such as mebendazole, levamisole and clofazimine showing antifilarial activity in experimental models were reported which appear promising candidates for clinical use. It was suggested that the difference in sensitivity of the fructokinase of the

filarial parasite and that of the human host could form the basis for development of new antifilarials. Different aspects of immunity in filariasis were reviewed, including the mechanism of prolonged survival of organisms in the absence of clinical manifestations, rejection of infection and establishment of immunity, antibody-dependent cell-mediated immune factors, metabolic inhibitors and nutritional factors. The importance of more work on immunodiagnosis of filariasis was stressed and the drawbacks of present serologic and skin tests were pointed out. The shortcomings of various test models were mentioned; the *Brugia* model was recommended.

In the session on leishmaniasis the drawbacks of antimonials and other currently used anti-leishmanial drugs were discussed. Although better screening models were now available both *in vitro* in infected macrophages and *in vivo* in inbred mice strains, a more complete knowledge of parasite biochemistry and of host-parasite relationship was required for rational design of effective drugs. An account was presented of the epidemiological picture of cutaneous leishmaniasis in hyper-endemic areas of USSR.

In the final scientific session, on immunoregulators, the use of natural and synthetic immunostimulants derived from bacterial cell wall, particularly MDP and TDM, in control of various infections was highlighted. The state of art concerning systematic use of small molecular weight synthetic compounds as immunostimulants was reviewed. An interesting paper dealt with drug-carrier complexes such as with DNA, liposomes and cytotoxic proteins for the treatment of protozoal infections. □

Workshop on Microbial Degradation of Industrial Wastes

A five-day national workshop on Microbial Degradation of Industrial Wastes was held at the National

Environmental Engineering Research Institute (NEERI), Nagpur, during 23-28 February 1981. Held under the sponsorship of the Department of Environment, the workshop was attended by 51 delegates; fourteen state-of-art papers were presented. Thirteen priority industries were identified for studying microbial degradation; these are: distillery, petrochemicals, pulp and paper, coal processing, fertilizer, tannery and slaughter house, food processing and dairy, oil refinery, pharmaceuticals and fermentation, basic organic chemicals, dyes and pigments, pesticides, and plastics and polymers.

The workshop reviewed, with a view to considering them as All India Coordinated Projects, 30 project proposals relating to the study of microbial profile at different stages of treatment plants with special reference to dominant microorganisms in the well-established waste treatment plants.

The workshop emphasized the need for establishing a national microbial culture bank for industrial use and resolved that NEERI should coordinate in this direction the efforts of the concerned agencies and institutions. The need for establishing an information support and data bank in the field of microbial cultures was also felt. The Department of Environment was urged to provide the necessary assistance.

Considering the low manpower available in the field of environment microbiology, the workshop stressed the need for promoting the manpower development and training programmes in the field.

Dr S. Varadarajan, Chairman-cum-Managing Director, Indian Petrochemicals Corporation Ltd, Vadodara, in his inaugural address, said that the programme of waste management should be given serious attention. He urged NEERI and the Department of Environment to establish a micro-plan cell for studying the water resources needs for the manufacture of steel, paper, glass and ceramic in-

dustries. The pollution due to oil spillage at ports and oceans also required urgent attention, Dr Varadarajan added.

Speaking on the occasion the NEERI's Director Dr B.B. Sundaresan said that India had a pivotal leadership role to play by assisting developing countries to solve their problems by providing appropriate technological solutions. He said that the Technical Cooperation among Developing Countries (TCDC) concept was steadily gaining popularity.

Earlier, Shri M. Parabrahmam, Principal Scientific Officer, Department of Environment, welcomed the delegates. □

CFRI Produces White Ash from Paddy Husk

The Central Fuel Research Institute (CFRI), Dhanbad, has developed a process for selective incineration of the blackish burnt paddy husk to carbon-free white ash at temperatures lower than 700°C. Also, a chemical technique has been developed for isolating the white ash quantitatively, directly from paddy husk itself. As substantial quantities of oxalic acid are produced as a byproduct, the process is economically viable.

Paddy husk contains about 20.25% ash, about 92% of which is silica which is much less contaminated with boron, arsenic, tin, etc. Such amorphous silica is highly priced and is in great demand for the production of special-grade silicon which is suitable for solar cells and various electronic gadgets. □

CRRI Develops New Designs of Bullock-carts

The Central Road Research Institute (CRRI), New Delhi, has developed, at the instance of the Union Ministry of Shipping and Transport, ten new designs of bullock-carts incorporating innovative features like low-friction bearings, adjustable draw-bars, pneu-

matic wheels, wooden wheels with solid rubber tyres, lighter loading platforms and braking systems.

The CRRI's Director Prof. C.G. Swaminathan, handed over recently the prototypes of these carts to ten farmers selected by the Agriculture Department of the Delhi Administration. The field performance of the carts will be monitored for working out further modifications. □

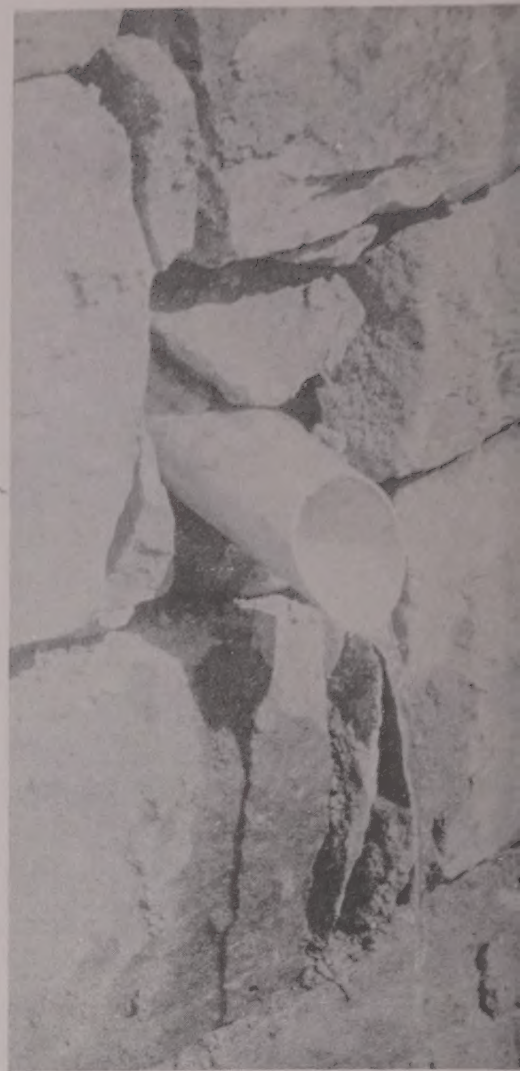
Novel Conversion of Coal into Simpler Organic Products

One of the favoured routes for conversion of the macromolecular organic complex of coal into simpler organic chemicals and products is the oxidation route. A major drawback of this route, however, is that it requires inordinately high proportions of costly oxidants like permanganate, nitric acid and hydrogen peroxide. The Central Fuel Research Institute (CFRI), Dhanbad, has overcome this drawback through a novel oxidation technique in which coal is converted essentially with air and a small proportion of nitric acid, into water-soluble polycarboxylic acids. These acids could be a good source of a host of aromatic and aliphatic chemicals, and could also serve either as a base or intermediate in the synthesis of ion-exchangers, plasticizers, resins, fertilizers, etc.

The CFRI process requires one tonne of nitric acid per tonne of coal as against 6-8 tonnes of the oxidants required conventionally. □

CRRI Corrects Landslides through Horizontal Drains

The Central Road Research Institute (CRRI), New Delhi, has developed a new technique of landslide correction which consists in providing horizontal drains in the landslide-prone areas. The technique has been successfully tried in one of the landslide-prone areas along the Coonoor-Ootacamund Highway in Nilgiri Hills. The principle underlying



Water draining out from the installed horizontal drain

the technique is that the drain relieves excess hydrostatic pressure within the mass and restores stability.

The drains are made of rigid slotted pipes, 6 to 20 m in length, installed at a grade of 5-10° to the horizontal. The discharge from the drains even in the off season has been found to be promising.

The technique holds promise for successful application for correcting landslides along border roads in the Himalayan region.

The work was taken up by CRRI as a constituent of the Civil Engineering Consultancy Services of CSIR, at the request of government of Tamil Nadu. The institute is now working out the methodology for rationalizing the design.

Chemistry of Microcrystalline Waxes

Microcrystalline waxes are complex mixtures of hydrocarbons consisting

anes, branched-chain alkanes, substituted cycloalkanes, and alkylated aromatics. As the nature and relative proportions of various hydrocarbons depend upon the refining technique as well as the origin of crude oils, microcrystalline waxes differ widely in composition and consequently in properties. Hence, for producing maximum quantities of various grades of waxes for different end uses, it is necessary to understand the chemistry and composition of microcrystalline waxes present in indigenous crudes and obtainable through various techniques as well as correlation of the composition with critical performance parameters. This was the aim of a study made by Shri I. Agrawal of the Indian Institute of Petroleum (IIP), Dehra Dun.

For the study, microcrystalline waxes were separated from tank bottoms of Rasagar, Kalol, Navagam, North Parat (mixed) and Ankleshwar crudes, from sucker rod wax scraping of Jam region and from residual stocks of Ankleshwar and Kalol crudes. Their melting points varied between 75.2° and 100°C, while oil content was below 5%. The molecular weights ranged from 570 to 866 (average carbon number between 41 and 62). The crude source as well as the method of separation influenced the properties of microcrystalline waxes.

The composition of the microcrystalline wax samples was determined by (i) urea adduction, an approximate indication of *n*-paraffins, and (ii) silica-alumina dual column chromatography to estimate alkyl aromatics. The urea adductables varied between 39.4 and 55%, and aromatics from 5.9 to 10.6%. The brittleness and contraction of waxes were quantitatively influenced by the urea adductables.

The melting point distribution of the waxes was obtained by multistage fractional crystallization. Each wax had a characteristic melting point distribution. The melting point of the wax depended largely on its high-melting components. With regard to penetration at higher temperatures, the low-

melting component had a profound influence.

The chain branching in the waxes was studied by infrared, proton nuclear magnetic resonance and ¹³C-nuclear magnetic resonance spectroscopy. All the microcrystalline waxes showed branching. The percentage of methyl content (number of methyl groups per 100 methylene groups) as determined by IR spectroscopy varied between 4.3 and 7.0. The low-melting flexible microcrystalline waxes obtained from residual stocks of crude oils showed a higher percentage of methyl content than hard microcrystalline waxes obtained from tank bottoms and sucker rod wax scrapings. The NMR values of percentage of methyl content were somewhat higher than those obtained by IR spectroscopic method; however, the trend was identical. Different values of percentage of methyl content were obtained for saturate fractions in comparison to parent waxes. Such properties of microcrystalline waxes as melting point, hardness, brittleness, plasticity and contraction were governed by the percentage of methyl content, which represents the extent of branching.

NMR results indicated in all the waxes the presence of alkane chains containing more than five carbon atoms. Highly branched cycloalkane rings of five and six carbon atoms were their essential components.

Crystallinity as determined by IR spectroscopic method varied between 64.8 and 86.9%. X-ray diffraction method gave different estimates of crystallinity, but the maximum divergence was about 5% from the mean value. Crystallinity seemed to be influenced by the percentage of urea adductables and to a lesser extent by the degree of branching. Qualitatively, hardness, brittleness and plasticity of microcrystalline waxes were governed by crystallinity.

Shri Agrawal, who carried out the studies under the guidance of Dr G.C. Joshi of IIP and Dr S.P. Gupta of D.N. Degree College, Meerut, was awarded

Ph.D. degree by the Meerut University for his thesis based on the work. □

Statistical Models for Manpower Planning

Shri Devendra Sharma of the Manpower Division of CSIR has formulated statistical models for manpower planning by establishing relationships between (i) economic growth and employment, and between (ii) investment rate and employment in the different sectors of national economy. Based on the models, an investment pattern can be developed to maximize the employment potential consistent with economic growth. The models help in decision-making for the directive of investment in different channels so that a maximum number of jobs could be created. The models also provide guidelines for employment in the various sectors, giving maximum economic return for a fixed investment.

The data on educated manpower, employment, employment by occupation, economic growth, investment, etc., obtained from various departments and organizations of the Government of India, were processed on a computer.

For his thesis 'Statistical appraisal of unemployment of educated persons' based on the studies, Shri Sharma was awarded Ph.D. degree (1981) by the Meerut University. □

Deputation Briefs

Dr K.S. Rajagopalan of the Central Electrochemical Research Institute (CECRI), Karaikudi, led an Indian delegation to USSR, during 17 November-1 December 1980 and drew up a detailed programme of work in the field of corrosion and corrosion protection of metals to be carried out in 1981-83 jointly by the R&D institutions of the two countries. A protocol identifying the work programme was also signed.

For the purpose of implementation of the programme, the Corrosion Institute (USSR State Committee for Science &

Technology) and CECRI would act as coordinators in the two countries.

Dr Rajagopalan also visited Bulgaria (2-19 Dec.) and prepared a detailed programme under items on atmospheric corrosion and performance of protective schemes, and cathodic protection of the protocol of the sixth session of the Joint Indo-Bulgarian Sub-Commission on Scientific and Technological Commission.

The Metal Protection Institute, Sofia and CECRI would be the coordinators for the respective countries.

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On invitation from the WHO Regional Office for Europe, Copenhagen, Dr B.B. Sundaresan, Director, National Environmental Engineering Research Institute (NEERI), Nagpur, attended during 2-5 February 1981, the WHO Task Group meeting to prepare international guidelines for drinking water quality. This was the third meeting; two earlier meetings had been held during 22-26 September and 18-25 November 1980. Health-related inorganic parameters and organic compounds were discussed in the earlier meetings. The present one, where Dr Sundaresan was unanimously elected chairman, discussed organoleptic substances.

Background material on the revision of drinking water standards and selection of organic substances for inclusion in guidelines for drinking water quality was reviewed in respect of various substances and physical characteristics to quantify acceptable limits for such substances.

NEERI, it may be mentioned, is designated as the Regional Reference Laboratory for South-East Asia on Community Water Supply and Sanitation.

* * *

Shri A.D. Bhide of NEERI attended, on invitation, a workshop on solid waste disposal and utilization held at the Royal Tropical Institute, Amsterdam, The Netherlands during 13-17 October 1980.

Shri Bhide presented a country paper which pointed out the extensive work that had already been done and the information that was available in India in the field of solid waste disposal and utilization.

The workshop was attended by 20 participants from 10 countries; besides 25 experts from The Netherlands and international agencies such as WHO, UNIDO, World Bank and FAO participated.

* * *

On invitation from the National Technical Information Service (NTIS), USA, Dr S.S. Iyer of the Central Drug Research Institute, Lucknow, participated in an information systems management workshop held at Washington DC, from 20 to 31 October 1980. Intended to expose the participants to the NTIS information system, the workshop included lectures and practical classes covering the various aspects of the NTIS activities. Dr Iyer gave a talk on National Information Centre for Drugs & Pharmaceuticals (NICDAP) and discussed with the participants as to how coordination could be effected between NICDAP and related information centres of the participating countries in the field of drugs and pharmaceuticals.

Dr Iyer also visited several libraries and information bases in USA, UK and France on his way back to India. □

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Shri R. Sambasivan of the Publications and Information Directorate, New Delhi, was deputed to attend the Winter College (3 Feb.-3 April 1981) on LASERS in Atomic and Molecular Physics (LAMP) held at the International Centre for Theoretical Physics (ICTP), Trieste (Italy), under the sponsorship of UNESCO and the International Atomic Energy Agency. The lectures were followed by seminars and workshops. At the LAMP Conference Shri Sambasivan read a paper on 'Laser diffraction'. Besides, he held discussions with Professor Abdus

Salam, Director (ICTP), and other physicists of the centre on current developments in theoretical physics. Shri Sambasivan also visited the Laboratory of the H.C. Orsted Institute, University of Copenhagen, Copenhagen (Denmark), where he worked earlier (1968-69) as research scholar. Further, he delivered an invited seminar lecture 'Electron scattering and Laser diffraction - analogy', at Fachbereich Physik, University of Kaiserslautern, Kaiserslautern (West Germany).

Shri Sambasivan also visited the International Atomic Energy Agency, Vienna (Austria), and the International Institute for Applied Systems Analysis, Schloss Laxenburg (Vienna).

PROGRESS REPORT

CMERI Annual Report: 1978-79

The designing and development of paddy husk combustor-cum-heat exchanger for drying of parboiled paddy, hydraulically operated coil expander and spreading machine, high discharge pedal pump for lift irrigation, automatic wool knitting machine, palmirah nebulizer, evaporator, and high-speed wire drawing machine are the highlights of the annual report of the Central Mechanical Engineering Research Institute (CMERI), Durgapur, for 1978-79. The report reveals that CMERI and its constituent MERADO centres had on hand 30 sponsored and 76 in-house projects. Fifteen of the sponsored projects were completed. Seven projects were pursued in collaboration with other R&D institutions.

The combustor-cum-heat exchanger developed by the institute at the instance of the Food Corporation of India (FCI) and the Ministry of Food and Agriculture, and in collaboration of the Central Fuel Research Institute (CFRI), Dhanbad, makes use of the agricultural waste, paddy husk, in place of furnace oil. The first experimental plant installed at FCI's rice mill at Durgapur

ates 6000-8000 cu ft of hot air per drying 48 tonnes of parboiled in 4 hr. FCI alone has 22 rice mills parboiling facility where 12,000 kl furnace oil costing about Rs 18.5 is consumed annually.

hydraulically operated coil expand- and spreading machine was developed for making closed loop coil for rotor or stator of electrical machine. The machine drastically cuts production time and improves quality of the finished coil. A mechanical type coil expanding and spreading machine was also developed for small-medium-scale industries.

low-cost, manually operated pedal pump was designed and developed for irrigation. It can handle water with sand and other impurities and has an average discharge of 6000 litres/hr at a head of 6 ft; the head could be increased to 10 ft depending upon the operator's skill.

With a view to ensuring higher output and quality finish of woven cloth, a power loom was designed. While eliminating the hand operation completely, the device would provide the weaver an opportunity to earn more.

Designed and developed for a telephone cable industry was a high-speed double-twist type machine for twisting pair of paper/plastic cables. Capable of twinning cables of 0.4-1.3 mm size, the machine could deliver 50-m of twinned cable per minute.

The institute took up the design and development of a low-cost tractor with a 5 hp diesel engine. Work on the mechanical design, layout and sub-assembly was completed.

Work was pursued on the design and development of an open-cycle solar refrigeration system using water as refrigerant and lithium chloride brine as absorbent. Complete design of a 1-tonne refrigeration system was made.

MERADO, Durgapur, developed a non-metallic backing strip with a view to reducing welding time and cost in comparison to conventional double-metallic welding. The non-metallic backing

strip comprising mainly glass wool, ceramic and asbestos, is burnt out during welding operation, leaving a smooth weld bed. Cleanliness of the back side is achieved simply by tapping and brushing. These strips will find wide application in shipbuilding industry.

MERADO, Ludhiana, designed and developed an automatic wool knitting machine. Marketed by a firm at a price of Rs 1600, the machine enables a housewife to complete 8 multicoloured garments in a day. The entire cost of the machine can be recovered in 3-4 months.

MERADO, Pune, has completed the design of a high speed wire forming machine for an operational speed of 500-600 rpm. The centre also modified the design of a cone screw mixer used in mixing products like adhesives, cosmetic cream, detergents and dye-stuffs.

MERADO, Madras, developed a palmirah neera evaporator. The syrup made can be further used in the manufacture of confectionary and sugar.

One of the institute's basic investigations during the year concerned the study of aerodynamics of corner fired furnace. Using a laboratory scale model, 1/25th of the full size, experiments were in progress to establish a generalized correlation between the flow field and the physical parameters of the system. Another basic investigation aimed at studying the effects of solid lubricants in case of metal forming operation. □

PATENTS FILED

453/Del/80: A new process for the preparation of IR, cis-2,2 dimethyl-3(2-oxopropyl) cyclopropanecarboxylic acid, an important intermediate for the synthesis of pyrethroid insecticides, R.B. Mitra, G.D. Joshi & A.S. Khanra—NCL, Pune.

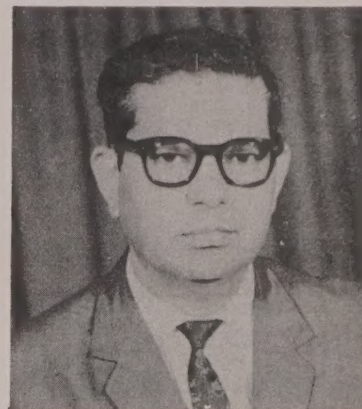
508/Del/80: Improvements in or relating to the electrolytic reduction of salicylic acid to salicylaldehyde, H.V.K. Udupa, K.S. Udupa, K. Jayaraman, T.D. Balakrishnan & S. Krishnamurthy—CECRI, Karaikudi.

PERSONNEL NEWS

Appointments/Promotions

Dr Hari Narain

Dr Hari Narain has assumed charge of the office of the Director, National Geophysical Research Laboratory,



Hyderabad, on the expiry of the period of his foreign service with Banaras Hindu University, Varanasi, as Vice Chancellor (16 May 1981).

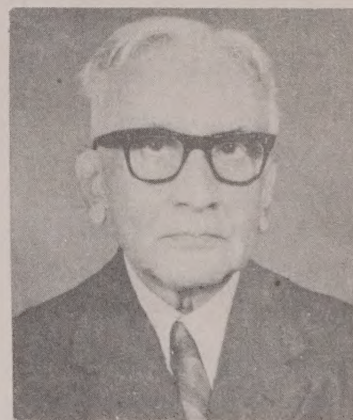
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Dr V.K. Kondawar has been appointed Technical Officer B (Instrumentation) at the National Environmental Engineering Research Institute, Nagpur (20 Feb. 1981). □

Obituary

Dr K. Venkataraman

Dr K. Venkataraman, the former Director of the National Chemical Laboratory (NCL), Pune, passed away on 12 May 1981. He headed the Pune laboratory from 1957 to 1966.



Dr Venkataraman (born 7 June 1901) received his early education in Madras. He took his M.Sc.(Tech.) in colour chemistry and Ph.D. under the guidance of Sir Robert Robinson, Nobel Laureate. He was later awarded the Doctor of Science degree of the Manchester University.

After his return to India he was appointed Professor of Organic Chemistry at the Forman Christian College, Lahore (1933-34). He had been associated with the Department of Chemical Technology, Bombay since 1935, as Reader in Dyeing and Printing (1935-36) and later as Modi Professor and Director.

Dr Venkataraman joined NCL as its Director on 1 August 1957. During his tenure at NCL as well as in the earlier years, his research interests spanned such diverse areas as chemistry of synthetic dyes, plant phenolics and other natural colouring matters, general organic chemistry including surface active agents and textile chemistry.

Though he retired in 1966 he continued his researches in organic chemistry at NCL till late 1980 and dominated the Indian organic chemistry field for well nigh four decades. He has been largely responsible for putting India on the International R&D map in chemistry of dyestuffs and colouring matters.

He had published over 250 research papers. The *Chemistry of Synthetic Dyes*, volumes 1 and 2, brought out by him, have remained the only text books for students of dyestuff technology. These two volumes have been translated into Russian and Chinese. Later, he edited six more volumes on the *Chemistry of Synthetic Dyes* and also a special volume exclusively devoted to the analytical chemistry of synthetic dyes, published by Wiley International Science.

Venkataraman was recipient of innumerable national and international honours and awards. He was awarded Padma Bhushan in 1961 for giving "more shape and content to the work of the NCL". The Mendelev Institute of Chemical Technology, Moscow, conferred on him the honorary degree of Doctor of Science. He was a Fellow of the National Academy of Sciences, India. The Deutsche Akademie Der Naturforscher Leopoldina elected him as Honorary Fellow and the Polish Chemical Society as Honorary Member.

In addition he was elected as Fellow of the USSR Academy of Sciences, Moscow, and member of the Polish Academy of Sciences. In recognition of his contribution to the chemistry of dyestuffs he was conferred Honorary Fellowship of the Dyers and Colourists, UK. □

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

It is proposed to appoint three Scientists F (Deputy Directors) for the Regional Research Laboratory (RRL), Jorhat.

RRL, Jorhat, is a multi-disciplinary chemical industry-oriented institution with a staff of nearly 550 including 200 professional staff, covering the following R&D areas-Analytical Services; applied civil engineering; biochemistry; chemical engineering; coal; geo-science; inorganic chemistry; organic chemistry; papers and boards; and petroleum & natural gas. Reasonable workshop facilities exist and analytical tools include UV, IR, NMR, mass spectrometer, DTA, rheometer, amino acid analyzer, etc. The laboratory has created very good pilot plant facilities for scaling up processes.

Job requirement - Post No.1

This is a senior research management position in the area of coal. The selected candidate is expected to provide high level leadership to identify, plan and conduct research and development programme and organize transfer of technology in this area in the context of the coal resources of the north-east region.

Qualifications: High academic qualifications in science, technology or engineering, at the doctorate level or equivalent with 10 years' experience in R&D in coal and related energy areas. Proven capability as independent investigator. Up-to-date knowledge of the coal and coal-based industries in the country and world trends.

Job requirement - Post No.2

This is a senior research management position in the area of chemical engineering. A major R&D activity of the laboratory is directed towards design and scaling up of processes developed in the different R&D groups of the laboratory, preparation of process know-how and basic design engineering, techno-economic evaluation of processes and allied activities. Current projects are: process development and basic design of pesticides; drugs; organic and inorganic intermediate petroleum additives and plant based chemicals. The selected scientist is expected to provide a high level leadership to this area, and organize efficient transfer of technology of the developed processes.

Qualifications: High academic qualifications in chemical engineering/chemical technology, least ten years' research experience in development and basic design engineering, possess leadership qualities; ability to effectively work with senior scientists of disciplines, administrative and managerial abilities, knowledge of and keenness to apply chemical engineering techniques. Evident capability to lead a team of scientists and engineers concerned with technology generation, assessment and transfer.

Job requirement - Post No.3

This is a senior management position in the area of applied civil engineering related to the utilization of locally available building materials and agro-industrial wastes for the development of building materials and new techniques of construction. The incumbent is expected to lead a team of workers engaged in engineering consultancy work in the evaluation of building materials and soil investigations, building research and development work in the above areas. He will also be required to assist the Director of the laboratory in such other matters as may be assigned to him, particularly looking after various stations of the laboratory in other parts of the eastern states and advise the government, government organizations in construction matters.

Qualifications: High academic qualifications in civil engineering with at least 10 years' experience in civil engineering, low cost building materials, methods and techniques or experience in design and construction, analytical consultancy services. Proven capability in research management is desirable.

Salary/conditions of service: Scale: Rs 125/2-2500. Initial pay will be fixed according to merits.

The persons selected will be appointed on a contract for a period of six years, which would be confirmed after an initial period of two years of satisfactory service. Other conditions of contract will be supplied on request. Qualifications and experience are relaxable in the case of candidates otherwise found suitable for the post.

Age limit: Below 50 years, relaxable in special cases.

Scientists/technologists interested may obtain two copies of the standard pro forma for submission of their *curriculum vitae* from the Council of Scientific and Industrial Research, Rafi Marg, New Delhi 110001. They can also obtain a brochure on the aims and objects and latest annual report of the laboratory. Completed *curriculum vitae* in pro forma, must be received in this office on or before 25 June 1981.

Note: Those who have already applied for Post No.1 in response to advertisement no.1/79 need not apply again as they will be considered on the basis of applications sent earlier.